TECHNICAL SCHEDULE - I

IPMS, Instrumentation, Control & Automation Equipment's for T. K. Halli CWPS, Stage IV Phase-I

Instrumentation & Control Equipments

Note: The bidder shall provide complete information in the schedule as required under the bid specification for technical qualification**. (Offered Quantities shall be mentioned, based on offered integrated Solution, in case of any additional items required, same shall be indicated).**

For the detailed Specification of the items, Contractor shall refer to the Part 1: General Instrumentation, Control and Automation Requirements of IOT based IPMS & Part 2 : Particular Instrumentation, Control and Automation Requirement of IOT based IPMS.

Sr. No.	Description	Unit	Particulars
1.1	**INTEGRATED PUMP PERFORMANCE MANAGEMENT SYSTEM**		
1.1.1	IOT Temperature Sensor for **Motor windings** (U,V,W) with all accessories and fixtures Make and Model Country of Origin		
1.1.2	IOT Temperature sensor for Motor Bearing (Driving end and Non Driving end) - 2 Nos for Each Motor with all accessories and fixtures Make and Model Country of Origin		

Sr. No.	Description	Unit	Particulars
1.1.3	Designing, Supplying, Installing, Commissioning & Testing of IOT Temperature sensor for Pump Bearing (Driving end and Non-Driving end) -Make and Model Country of Origin		
1.1.4	IOT Water Temperature Transducer for Suction Side and Delivery side with all accessories and fixtures Make and Model Country of Origin		
1.1.5	IOT Water Pressure Transducer for Suction Side and Delivery side with all accessories and fixtures Make and Model Country of Origin		
1.1.6	Conductivity type Level Switch (back up to level transmitter), High Level & Low Level sensing (0-6 m with 4 point contact) with necessary instrumentation cabling, glands with suitable stub and flange and bolting arrangement for hook-up, as applicable and necessary Make and Model Country of Origin		

Sr. No.	Description	Unit	Particulars
1.1.7	Level Gauge with iron sheet or Enameled gauge plate of 3 mm to 4 mm thick, 0.23 m width copper floats indicators and flexible Nylon wires, painting figures with approved enamel paint etc. with all lead and lifts, complete for: (Enameled Gauge plate for 0-6 m) Make and Model Country of Origin		
1.1.8	IOT Pressure Transmitter on transmission mains (1500mm) with necessary instrumentation cabling, glands and conduit with suitable stub and flange and bolting arrangement for hook-up, as applicable and necessary Pressure switch (0-25 bar) Make and Model Country of Origin		
1.1.9	IOT Accelero Sensor for Motor with all accessories and fixtures (DE – X & Y axis and NDE-X & Y axis) Make and Model Country of Origin		

Sr. No.	**Description**	**Unit**	**Particulars**
1.1.10	IOT Accelero Sensor for Pump with all accessories and fixtures (DE – X & Y axis and NDE-X & Y axis) Make and Model Country of Origin		
1.1.11	Ultrasonic Flow Meters (Multipath) for Common Header with all accessories and fixtures (Line size : 1500 mm) Make and Model Accuracy : Country of Origin		
1.1.12	IOT Noise Sensor with all accessories and fixtures Make and Model Country of Origin		
1.1.13	IOT RPM Sensor with all accessories and fixtures Make and Model Country of Origin		

Sr. No.	**Description**	**Unit**	**Particulars**
1.1.14	Radar Level Transmitter with Indicator with 4 level Switching for Water Tank Level (8m-4 Levels) with all accessories and fixtures Make and Model Accuracy : Country of Origin		
1.1.15	IOT Web camera with all accessories and fixtures Make and Model Country of Origin		
1.1.16	Field Instruments Cabinets and SMPS + MCB with all accessories and fixtures Make and Model Country of Origin		
1.1.17	Moisture sensor (water content in oil/grease) with all accessories and fixtures Make and Model Country of Origin		
1.1.18	Thermal image sensor / camera with all accessories and fixtures Make and Model Country of Origin		

Sr. No.	**Description**	**Unit**	**Particulars**
1.1.19	Smart LCD Screen 55" with all accessories and fixtures Make and Model Country of Origin		
1.1.20	Touch Screen Pump Monitoring Station for Individual Pump with all accessories and fixtures Make and Model Size Country of Origin		
1.1.21	Edge Hardware with all accessories and fixtures Make and Model Country of Origin (Bidder to mention break up of all Edge Hardware with accessories)		
1.1.22	IOT Station : Common Touch Screen Data console with Web based Fully Pump Performance Management Solution and Remote Data management in Cloud Software along with License with all accessories and fixtures (with complete Data analytics and Diagnostics Suites) Make and Model Size Country of Origin		

Sr. No.	**Description**	**Unit**	**Particulars**
1.1.23	Pressure Gauge: Glycerin filled stainless steel pressure gauge of 150 mm Dia. suitable for the pump sets with nipple, snubber for vibration resistance and necessary length of SS tubing suitable for mounting on the delivery of pump , including 15 NB isolating valve for maintenance etc., complete with all lead and lifts etc, as applicable and necessary. Bourdon type Pressure gauge (0-25 bar) Make and Model Snubber / Gauge Protector Country of Origin		
1.1.24	Instrument control panel with Alarm Annunciator with all accessories complete Make and Model Country of Origin		
1.1.25	Junction boxes as per site condition Make and Model Country of Origin		
1.1.26	Surge protection Devices for the instruments Surge Rating Make and Model Country of Origin	kA	

Sr. No.	**Description**	**Unit**	**Particulars**
1.1.27	ON-LINE UPS system suitable for operation on 230V, 50Hz, A/C supply, with isolation transformer all accessories complete and Excluding batteries and wiring complete. (10 KVA) Make and Model Capacity Backup time considered for each purpose. Indicate separately for each. No of batteries Country of Origin		
1.1.28	Battery Bank : 12V DC, AH batteries in poly propylene container for U.P.S. Sealed maintenance free batteries. (80 AH Capacity) Make and Model Country of Origin		

Sr. No.	Description	Unit	Particulars
1.1.29	**Instrumentation and Control Cables (incl. Inst. Power)** Make No of Cores Type Shielding Country of Origin Armoured cables are to be considered: Each Cable type shall be mentioned separately		
1.1.30	**Cable Trays, Conduits and all other necessary Erection Hardware & accessories** Make: Type: Country of Origin:		
1.1.31	**Ethernet Managed Switch** (i) Make /Model (ii) No of Ports (iii) Country of Origin		
1.1.32	**AC distribution board for Instrumentation & Control and Telemetry System** Make and Model Country of Origin		

Sr. No.	Description	Unit	Particulars
1.1.33	Mobile App. For Android and Apple (Minimum 10 users) Make and Model Country of Origin		
1.2	**Surge vessels control system**		
1.2.1	Conductivity type Level Transmitter in shell of air vessel and Interfacing with IOT Station including all required Mounting accessories. Make and Model Country of Origin		
1.2.2	Magnetic type Level Switch in sensor shell of air vessel and Interfacing with IOT Station including all required Mounting accessories Make and Model Country of Origin		
1.2.3	Magnetic type Level Gauge in sensor shell of air vessel and Interfacing with IOT Station including all required Mounting accessories. Make and Model Country of Origin		

Sr. No.	Description	Unit	Particulars
1.2.4	Pressure Gauge: Glycerin filled stainless steel pressure gauge of 150 mm Dia. suitable on top of Air vessel with nipple, snubber for vibration resistance and including 15 NB isolating valve for maintenance etc., complete with all lead and lifts etc, as applicable and necessary. Bourdon type Pressure gauge (0-25 bar) Make and Model Snubber / Gauge Protector Country of Origin		
1.2.5	IOT enabled Pressure Transmitter with necessary instrumentation cabling, glands and conduit with suitable stub and flange and bolting arrangement for hook-up, as applicable and pressure switching (0-25 bar) and also Interfacing with IOT Station. Make and Model Country of Origin		
1.2.6	Surge Vessel Control panel with required accessories, 3 KVA UPS, Battery Bank, Control and automation equipment inclusive of IOT Gateway with panel and HMI and interface with IOT Station and all necessary Cabling, tray-work etc. Make and Model Country of Origin		
1.3	**J. K. Doddi - INSTRUMENTATION Works**		

Sr. No.	Description	Unit	Particulars
1.3.1	Ultrasonic Level Transmitter (4m) with necessary instrumentation cabling, glands and conduit with suitable mounting arrangement for hook-up as applicable and also Interfacing with IOT Station Make and Model Country of Origin		
1.3.2	Level Switch (4m - 2 levels Hi & Lo) with necessary instrumentation cabling, glands and conduit with suitable mounting arrangement for hook-up as applicable and also Interfacing with IOT Station Make and Model Country of Origin		
1.3.3	Local Level Gauge Float & Board type with suitable mounting arrangement for hook-up Make and Model Country of Origin		
1.3.4	IOT Pressure Transmitter with necessary instrumentation cabling, glands and conduit with suitable stub and flange and bolting arrangement for hook-up, as applicable and necessary Pressure Switch (0-25 bar) and also Interfacing with IOT Station. Make and Model Country of Origin		

Sr. No.	**Description**	**Unit**	**Particulars**
1.3.5	Pressure Gauge: Glycerin filled stainless steel pressure gauge of 150 mm Dia. snubber for vibration resistance and including 15 NB isolating valve for maintenance etc., complete with all lead and lifts etc, as applicable and necessary. Bourdon type Pressure gauge (0-25 bar) Make and Model Country of Origin		
1.3.6	Local Control Panel + IOT Gateway with other necessary accessories and all Cabling, tray-work etc. Make and Model Country of Origin		
1.3.7	Instrument control panel with Alarm Annunciator with all accessories complete and all necessary Cabling, tray-work etc. Make and Model Country of Origin		
1.3.8	Communication Interface Unit (Redundant Communication GPRS) Make and Model Country of Origin		

Sr. No.	**Description**	**Unit**	**Particulars**
1.3.9	Surge protection Devices for the instruments Make and Model Country of Origin		
1.3.10	ON-LINE UPS system suitable for operation on 230V, 50Hz, A/C supply, with isolation transformer all accessories complete and Excluding batteries and wiring. (3 KVA) Make and Model Country of Origin		
1.3.11	Battery Bank : 12V DC, AH batteries in poly propylene container for U.P.S. Sealed maintenance free batteries.(42 AH Capacity) Make and Model		
1.3.12	Junction Boxes as per site condition Make and Model		
1.3.13	Field instruments IP-65 enclosures for outdoor field instrumentation as per site condition Make and Model		

Sr. No.	Description	Unit	Particulars
1.4	**AUTOMATION SYSTEM**		
1.4.1	Edge Device / RTU (Hot standby CPU), IO panels with required accessories, simplex I/O Modules, Redundant managed ethernet switches, 16"HMI or Digital Mimic Panel, Redundant power supply etc. with all accessories complete. Note: IO count shall be inclusive of 20% spare IOs Make and Model: Hot standby Offered : Country of Origin:		
1.4.1.1	**HMI (Minimum 16”) for PLC Systems / Digital Mimic Panel** (i) Make (ii)Model No (iii) Country of Origin		
1.4.1.2	**Memory**		
1.4.1.3	**Redundant Power Supply Modules,** (i) Make (ii)Model No (iii) Country of Origin		

Sr. No.	Description	Unit	Particulars
1.4.1.4	**Communication Modules** (i) Make (ii) Model No (iii) Country of Origin		
1.4.2	RTU software & 16” HMI programming software with all accessories complete		
1.4.3	Portable Industrial Programming Unit (Laptop-16” screen) loaded with licensed latest Windows operating system, IPMS programming software, MS Office, Antivirus software, with all accessories required to connect to RTUs and to monitor the plant if required, etc) (i) Make (i) Model Country of Origin		
1.4.4	IOT Station Console (i) Make (ii) Model Country of Origin		
1.4.5	Online & offline printers with all accessories complete - OFFLINE - ONLINE Country of Origin		

Sr. No.	Description	Unit	Particulars
1.5	**COMMUNICATION INTERFACE EQUIPMENT**		
1.5.1	Inter-operability test in co-ordination with Master SCADA integrator with all accessories complete		
1.5.2	Interface/integration Redundant GPRS communication equipment with CP-024 & MIS-2 contracts (i) Make & Model: (ii) Country of Origin: (iii) Redundancy offered:		
1.6	**TESTING REQUIREMENTS FOR ABOVE SYSTEM**		
1.6.1	Factory Acceptance Tests (FAT)		
1.6.2	Site Acceptance Tests (SAT)		
1.7	**MISCELLNEOUS WORKS**		
1.7.1	Dismantling of existing (Control Panels, Telemetry Panel, MIMIC Panel, Field Instruments, ICA relevant Cabling etc. as) complete ICA items from CWPS		

Sr. No.	Description	Unit	Particulars
1.7.2	**Supplying of 2.0 TR Invertor type split Air conditioners** suitable for operation on A/C supply single phase 50 Hz 230 V with hermetically sealed inverter compressor with air cooled condenser, latest R410A / R-32 refrigerant fan motor, start & run capacitors, relay & overload protector internal unit, with one indoor & one outdoor unit The condenser unit will be placed outside the room avoid noise including standard length of suitable size copper tubing covered with nitrile rubber insulation tube. suitable capacity 3 core sheathed/ PVC copper cable and a battery operated wireless remote unit.		